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The Fake Science Threat

By Sebastian Mallaby
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Five years ago China recruited Gavriel Salvendy, an American scientist from Purdue University, to set up a department of industrial engineering at Tsinghua University in Beijing. Salvendy didn't speak Chinese -- "not a word, apologies" -- but that didn't matter. In the department he created, 75 percent of the lectures and 100 percent of the textbooks are in English.

Tsinghua is China's top science university, and it had global ambitions even before Salvendy arrived. Professors were rewarded with \$700 bonuses every time they published in an international journal, which they did slightly more than 800 times in 2001. Salvendy turbocharged this system by extending bonuses to graduate students. By offering a ridiculously small sum -- \$125 -- he created a powerful incentive, because the standard pay for a research assistant at Tsinghua is around \$60 a month. Pretty soon, students were churning out work that appeared as papers co-authored with professors. By 2005, Tsinghua's international-journal count had jumped eightfold.

Salvendy has no doubt that Tsinghua scientists will soon be claiming Nobel Prizes, but the trickier question is what this means for the United States. The U.S. science establishment, led by the big research universities and high-tech companies, has just persuaded President Bush to ramp up math and science spending. Part of the rationale for this new "American Competitiveness Initiative" is that it's needed to defend U.S. economic leadership. But while generous math and science funding should be a government priority, the invocation of the threat from China is mostly spurious.

Science and math advocates have been harrumphing about national competitiveness for at least a quarter-century. In the early 1980s the National Science Foundation predicted "looming shortfalls" of scientists and engineers, and the National Commission on Excellence in Education declared, "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war." But the American economy went from strength to strength over the next decades, while supposedly more technical countries such as Japan and Germany foundered.

This hasn't stopped the science lobby from making the same arguments again. According to the recent report from the National Academies that inspired the administration's new competitiveness initiative, "the scientific and technical building blocks of our economic leadership are eroding at a time when many other nations are gathering strength." Further, the link between technological decline and economic decline is certain, since "85% of measured growth in US income per capita is due to technological change."

This is embarrassingly flimsy. When economists say that technological change drives living standards, they don't mean that scientific ingenuity achieves this by itself. What matters is the way science is diffused through an economy: the availability of venture capital, the flexibility of workers, the quality of corporate leadership, the competence of government policy, the reliability of public infrastructure -- all help to determine how science is absorbed. The United States scores well in nearly all these areas, which is why it's defied alarmist predictions for a quarter of a century and will continue to do so.

The science lobby should also stop pretending that countries compete the same way companies do. Firms such as Toyota and Ford really do go head-to-head against each other; if Toyota has superior technology, it will steal Ford's customers -- and Ford may even disappear. But if China produces Nobel-quality science, it won't put the United States out of business; rather, Chinese discoveries will help American scientists discover more, too. Equally, Toyota doesn't sell cars to Ford workers, so there's no benefit to Ford's people if Toyota's quality advances. But China does sell to Americans, so whatever makes it more productive has some upside for the United States as well.

In short, the "China threat" argument ignores the ways that competition between countries, unlike companies, is a positive-sum game. Moreover, to the extent that Chinese *institutions* -- firms or university laboratories -- compete against American ones, the alarmists underestimate U.S. strengths.

In the race to turn scientific ideas into businesses, the United States is hard to beat. There's no dividing wall between academic labs and commerce, and scientists surf from one world to the other on waves of money and cultural approval. Harvard's Richard Freeman, an economist who has studied the market for scientific talent, recounts a conversation with a physicist who'd collaborated with foreigners. "Ah, so you are helping them to catch up with us," Freeman commented. "No, they are helping us keep ahead of them," came back the answer: Because of the superior U.S. business environment, the research was being turned into a company in the United States.

Equally, in the competition to retain the best research scientists, the United States has a lead that tends to reinforce itself. Because nearly all the world's top universities are American, the world's top researchers flock here; provided enough visas are available, it's hard to see why this would change. The story of Gavriel Salvendy, which some might see as an omen of America's declining status, is in fact more subtle. Salvendy has long recruited star Chinese graduate students to Purdue, where he still does most of his research. Of the 18 Chinese who have completed PhDs under his supervision at the Indiana campus, 15 have stayed on in the United States.